

What is claimed is:

1. A printing device comprising:

a judging unit for judging whether a service life of a loaded developing agent cartridge has expired; and

5 an operation mode setting unit for setting up its own operation mode to a safety mode in order to prevent printing troubles when said judgment unit determines that the service life of said developing agent cartridge has expired.

2. A printing device described in claim 1, further  
10 comprising:

a consumption information reading unit for reading consumption information that represents the degree of consumption of said developing agent cartridge at the present time stored in a memory unit of said developing agent cartridge,  
15 wherein

said judgment unit determines whether the service life of said developing agent cartridge has expired by comparing the consumption information of said developing agent cartridge read by said consumption information reading unit  
20 with preset service life information that represents the service life of said developing agent cartridge.

3. A printing device described in claim 1 wherein

said consumption information and service life information are based on a number of printed sheets, a number

of effective pixels used in forming images, or an amount of consumed developing agent.

4. A printing device described in claim 1 wherein  
said safety mode is to execute a printing process with  
5 an increased cleaning frequency, an increased calibration  
frequency or an increased communication frequency with a  
control center, or a reduced printing speed compared to those  
of a standard mode.

5. A printing device described in claim 1 wherein  
10 said developing agent cartridge is either a toner  
cartridge or an ink cartridge.

6. A printing device comprising:  
a judging unit for judging whether a service life of  
a loaded developing agent cartridge has expired; and  
15 an operation mode setting unit for setting up its own  
operation mode to a safety mode in which a printing process  
is executed with an increased cleaning frequency compared  
to that of a standard mode when said judging unit determines  
that the service life of said developing agent cartridge has  
20 expired.

7. A printing device described in claim 6 wherein  
said cleaning frequency is such that cleaning is executed  
in every page of image formation.

8. A printing method comprising:

a judging step of judging whether a service life of a loaded developing agent cartridge has expired; and

an operation mode setting step of setting up its own operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that the service life of said developing agent cartridge has expired.

9. A printing method described in claim 8, further comprising:

a consumption information reading step of reading consumption information that represents the degree of consumption of said developing agent cartridge at the present time stored in a memory unit of said developing agent cartridge, wherein

said judgment step determines whether the service life of said developing agent cartridge has expired by comparing the consumption information of said developing agent cartridge read by said consumption information reading step with preset service life information that represents the service life of said developing agent cartridge.

10. A printing method described in claim 8 wherein said consumption information and service life information are based on a number of printed sheets, a number of effective pixels used in forming images, or an amount of consumed developing agent.

11. A printing method described in claim 8 wherein  
said safety mode is to execute a printing process with  
an increased cleaning frequency, an increased calibration  
frequency or an increased communication frequency with a  
5 control center, or a reduced printing speed compared to those  
of a standard mode.

12. A printing method described in claims 8 wherein  
said developing agent cartridge is either a toner  
cartridge or an ink cartridge.

10 13. A printing method comprising:  
a judging step of judging whether a service life of a  
loaded developing agent cartridge has expired; and  
an operation mode setting step of setting up its own  
operation mode to a safety mode in which a printing process  
15 is executed with an increased cleaning frequency compared  
to that of a standard mode when said judging step determines  
that the service life of said developing agent cartridge has  
expired.

14. A printing method described in claim 13 wherein  
20 said cleaning frequency is such that cleaning is executed  
in every page of image formation.

15. A printing program for causing a printing device  
to execute:

a judging step of judging whether a service life of a

loaded developing agent cartridge has expired; and

an operation mode setting step of setting up its own operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that the service  
5 life of said developing agent cartridge has expired.

16. A printing program described in claim 15, further causing a printing device to execute:

a consumption information reading step of reading consumption information that represents the degree of  
10 consumption of said developing agent cartridge at the present time stored in a memory unit of said developing agent cartridge, wherein

said judgment step determines whether the service life of said developing agent cartridge has expired by comparing  
15 the consumption information of said developing agent cartridge read by said consumption information reading step with preset service life information that represents the service life of said developing agent cartridge.

17. A printing program described in claim 15 wherein  
20 said consumption information and service life information are based on a number of printed sheets, a number of effective pixels used in forming images, or an amount of consumed developing agent.

18. A printing program described in claim 15 wherein

said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center, or a reduced printing speed compared to those  
5 of a standard mode.

19. A printing program described in claim 15 wherein said developing agent cartridge is either a toner cartridge or an ink cartridge.

20. A computer-readable recording medium on which the  
10 printing program described in claim 15 is recorded.

21. A printing device comprising:

a judging unit for judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting unit for setting up its own  
15 operation mode to a safety mode in order to prevent printing troubles when said judgment unit determines that said developing agent cartridge is not an authorized product.

22. A printing device described in claim 21 further comprising:

20 a product information reading unit for reading product information for identifying a product of said printing device or said developing agent cartridge stored in a memory unit of said developing agent cartridge, wherein

said judging unit determines whether said developing

agent cartridge is an authorized product or not by comparing the product information read by said product information reading unit with a product information of an authorized product.

5           23. A printing device described in claim 21 wherein  
said safety mode is to execute a printing process with  
an increased cleaning frequency, an increased calibration  
frequency or an increased communication frequency with a  
control center, or a reduced printing speed compared to those  
10 of a standard mode.

24. A printing device described in claim 21 wherein  
said developing agent cartridge is either a toner  
cartridge or an ink cartridge.

25. A printing device comprising:  
15           a judging unit for judging whether a loaded developing  
agent cartridge is an authorized product; and  
an operation mode setting unit for setting up its own  
operation mode to a safety mode in which a printing process  
is executed with an increased cleaning frequency compared  
20 to that of a standard mode when said judgment unit determines  
that said developing agent cartridge is not an authorized  
product.

26. A printing device described in claim 25 wherein  
said cleaning frequency is such that cleaning is executed

in every page of image formation.

27. A printing method comprising:

a judging step of judging whether a loaded developing agent cartridge is an authorized product; and

5 an operation mode setting step of setting up its own operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that said developing agent cartridge is not an authorized product.

28. A printing method described in claim 27 further  
10 comprising:

a product information reading step of reading product information for identifying a product of said printing device or said developing agent cartridge stored in a memory unit of said developing agent cartridge, wherein

15 said judging step determines whether said developing agent cartridge is an authorized product or not by comparing the product information read by said product information reading step with a product information of an authorized product.

20 29. A printing method described in claim 27 wherein

said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center, or a reduced printing speed compared to those



of a standard mode.

30. A printing method described in claim 27 wherein said developing agent cartridge is either a toner cartridge or an ink cartridge.

5 31. A printing method comprising:

a judging step of judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting step of setting up its own operation mode to a safety mode in which a printing process  
10 is executed with an increased cleaning frequency compared to that of a standard mode when said judgment step determines that said developing agent cartridge is not an authorized product.

32. A printing method described in claim 31 wherein  
15 said cleaning frequency is such that cleaning is executed in every page of image formation.

33. A printing program for causing a printing device to execute:

a judging step of judging whether a loaded developing  
20 agent cartridge is an authorized product; and

an operation mode setting step of setting up its own operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that said developing agent cartridge is not an authorized product.

34. A printing program described in claim 33 further causing a printing device to execute:

a product information reading step of reading product information for identifying a product of said printing device  
5 or said developing agent cartridge stored in a memory unit of said developing agent cartridge, wherein

said judging step determines whether said developing agent cartridge is an authorized product or not by comparing the product information read by said product information  
10 reading step with a product information of an authorized product.

35. A printing program described in claim 33 wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration  
15 frequency or an increased communication frequency with a control center, or a reduced printing speed compared to those of a standard mode.

36. A printing program described in claim 33 wherein said developing agent cartridge is either a toner  
20 cartridge or an ink cartridge.

37. A computer-readable recording medium on which the printing program described in claim 33 is recorded.